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(56) Documents Cited:
WO 2002/058508 A3
DE 010035214 A
FR 002457087 A
US 5599126 A
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UK CL (Edition W) A4K
INT CL[7] A46B
Other: Online databases: EPODOC, WPI, and JAPIO

(54) Abstract Title: **Reservoir toothbrush**

(57) A disposable reservoir toothbrush 10 comprises a body 12 including a dentifrice reservoir 22, a head portion 14, a plurality of bristles 20 connected to the head portion, and a conduit 26 connecting the reservoir to the head portion. The reservoir includes a membrane 24 operable on from an external surface of the body to urge dentifrice from the reservoir, through the conduit, towards the head portion. A valve 30 may be used to further control the flow of dentifrice to the bristles. The device may also include gripping formations 18, adapted to facilitate gripping of the toothbrush by the user.

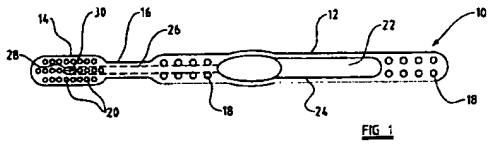

FIG 1

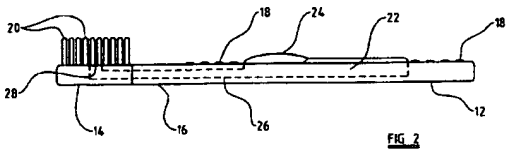

FIG 2

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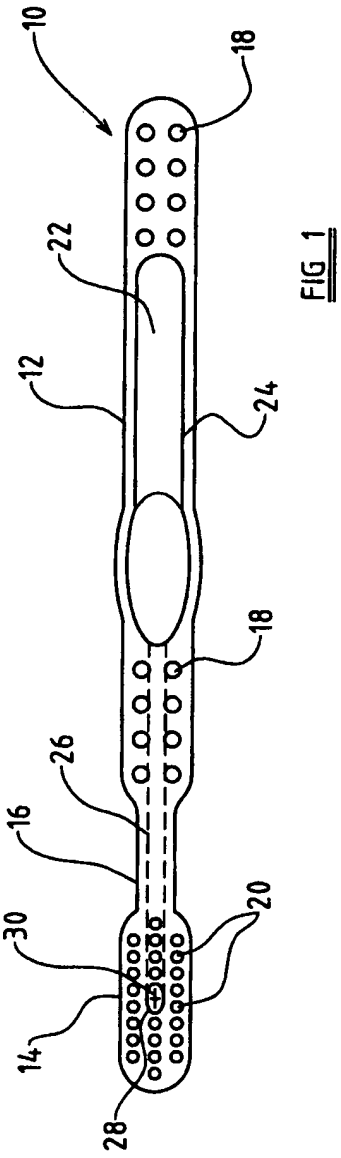

FIG 1

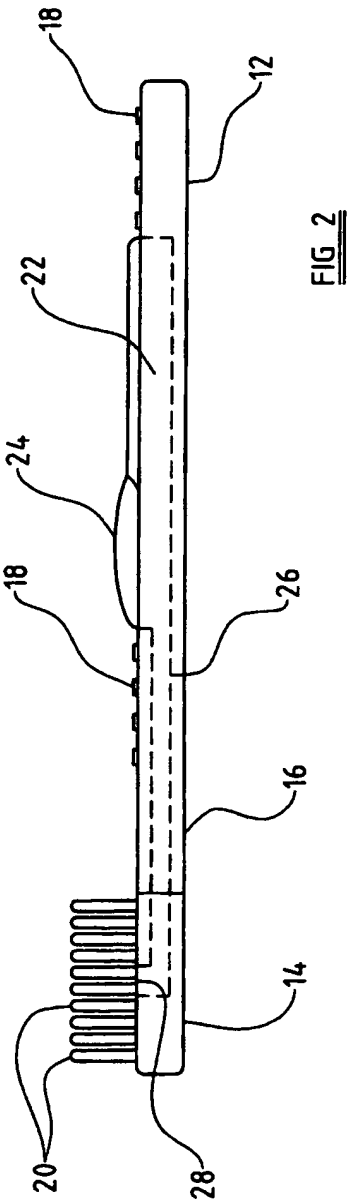

FIG 2

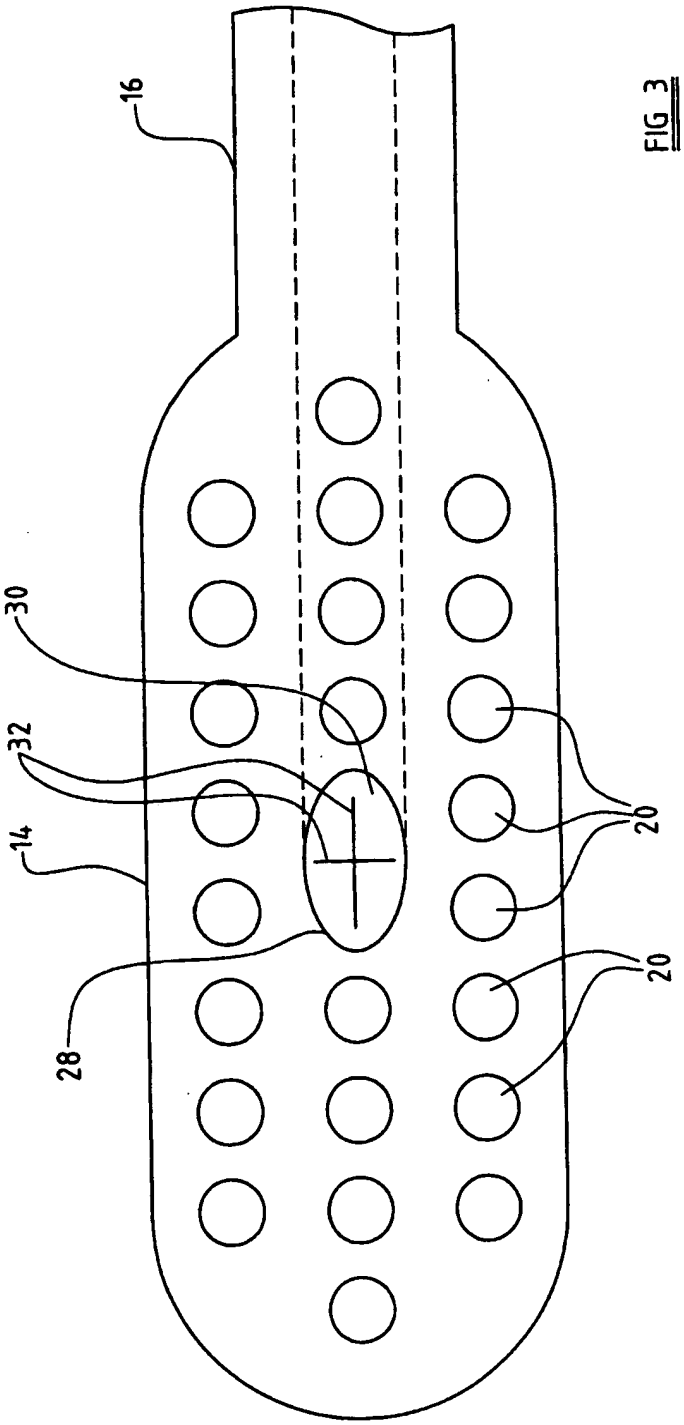

FIG 3

Title: Disposable Toothbrush

Description of Invention

This invention relates to a disposable toothbrush and particularly to a disposable toothbrush having a reservoir for dentifrice.

Disposable toothbrushes of the kind having a reservoir for dentifrice or toothpaste are known (e.g. for use particularly on business trips, holidays etc.), but have used mechanical mechanisms, such as, for example, a piston, operated by a user to urge the dentifrice to the head of the toothbrush between the bristles.

A problem with such toothbrushes is that they are expensive to manufacture and therefore cannot compete commercially with a combination of a standard toothbrush and a tube of dentifrice. The mechanisms used can often be problematic due to clogging up of the mechanism with dentifrice and are also clumsy and difficult to operate, which can lead to wastage of dentifrice.

There are also a number of hygiene problems which can occur due to the mechanical mechanism used and the period of time over which the toothbrush can be used (some of the known toothbrushes including large reservoirs, which are intended to be used over long periods, such as, for example, seven days or more).

Accordingly, dental practitioners have expressed reservations concerning these hygiene problems and have been reluctant to recommend or endorse the use of such toothbrushes for their patients.

It is therefore the object of the present invention to provide an improved disposable toothbrush, which seeks to overcome the aforementioned problems.

According to the present invention there is provided a disposable toothbrush having a body, the body including a dentifrice reservoir, a head

portion, a plurality of bristles connected to the head portion, and a conduit connecting the reservoir to the head portion, wherein the reservoir includes at least one membrane operable on from an external surface of the body to urge dentifrice from the reservoir, through the conduit, towards the head.

By providing the reservoir with a membrane, which is operable on from an external surface of the body, a user can urge dentifrice through the conduit, towards the head portion by apply a pressure to the membrane by, for examples, a finger or thumb, and then sliding the finger or thumb along the membrane towards the head portion. The finger or thumb thus deforming the membrane and forcing dentifrice through the conduit.

The membrane may form part of an external surface of the body.

The membrane may be operable on to deform the reservoir, thereby reducing the internal capacity of the reservoir and hence urging the dentifrice through the conduit.

At least part of the membrane may form a protruding part of the body. In such a way the reservoir may be provided in a variety of different sizes, thereby allowing the toothbrush to be used for only one use or a plurality of uses.

The conduit may terminate at at least one orifice on a surface of the head portion adjacent or close to the position where the bristles are connected to the head portion, thereby facilitating distribution of the dentifrice between the bristles.

The orifice may include a valve adapted to control flow of the dentifrice through the orifice.

The valve may include a valve membrane which has at least one slit therein.

The valve membrane may have two slits therein, in the form of a cross, or three slits therein, in the form of a 'Y-shaped' slit, such that when dentifrice is urged though the conduit the valve membrane deforms and permits dentifrice to flow through the orifice.

The valve may be a non-return valve, thereby allowing flow of the dentifrice in one direction only. Therefore, when the user stops urging dentifrice thought the conduit, the membrane inhibits flow of the dentifrice in the opposite direction, i.e. inhibits flow of the dentifrice through the conduit towards the reservoir.

The toothbrush may also, in the case of a multiple use disposable toothbrush, include a closure, such as, for example, a cap, to cover the head portion and bristles between uses, thereby preventing or substantially reducing any hygiene problems between subsequent uses.

The body may include a plurality of gripping formations adapted to facilitate gripping of the toothbrush by the user.

The invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 shows a plan view a disposable toothbrush in accordance with the present invention;

Figure 2 shows a side view of the toothbrush of figure 1; and

Figure 3 shows an exploded view of part of the toothbrush of figure 1.

Referring to the drawings, there is shown a disposable toothbrush 10 in accordance with the present invention having a body 12 and, a head portion 14 connected to the body 12 by a neck portion 16. Provided on the upper surface of the body 12 are a plurality of gripping formations 18, which assist a user in gripping the toothbrush 10. However, the gripping formations 18 may be provided on any of the external surfaces of the body 12 or neck portion 16.

Connected to a surface of the head portion 14 are a plurality of spaced bristles 20, which extend, approximately perpendicularly, away from the head portion 14.

A dentifrice reservoir 22, containing dentifrice such as, for examples, toothpaste or gel, is provided in the body 12. The reservoir 22 having a

membrane 24 at its upper surface. The membrane 24 forms a bulge on the upper surface of the body 12.

Provided within the interior of the body 12, neck portion 16 and head portion 14 is a conduit 26, which provides a channel through which the dentifrice can travel during use. The conduit 26 terminates at an orifice 28 on the surface of the head portion 14, where the bristles 20 are connected to the head portion 14.

A valve membrane 30 is provided in the orifice 28 (best shown in figure 3). The membrane 30 has two slits 32 therein, in the form of a cross.

During use, a user applies a pressure to a region of the membrane 24, preferably a region of the membrane 24 remote from the head portion 14, by either his/her thumb or one or more fingers. The user then slides his/her thumb or one or more fingers along the membrane 24, whilst applying the pressure, towards the head portion 14. Due to the applied pressure and movement of his/her thumb or one or more fingers, the membrane 24 forces the dentifrice contained within the reservoir 22 into and through the conduit 26 towards the membrane 30 in the orifice 28.

When the dentifrice reaches the valve membrane 30, the pressure of the dentifrice forces the valve membrane 30 to deform, due to the slits 32 therein. Thus the dentifrice flows though the valve membrane 30 and into the space between the bristles 20.

According to how much dentifrice the user wishes to use, the user may continue to slide his/her thumb or one or more fingers towards the head portion 14 until the desired quantity of dentifrice protrudes through the valve membrane 30 into the space between the bristles 20. Once the desired quantity of dentifrice has protruded from the orifice 28, the user ceases to apply the pressure to the membrane 24. The user can then use the toothbrush 10, in the conventional way, to clean his/her teeth.

The valve membrane 30 inhibits flow of the dentifrice back through the conduit 26, towards the reservoir 22, thereby reducing or eliminating any hygiene problems.

If the toothbrush 10 is intended for multiple use, the user may need to apply a pressure of a higher magnitude to the membrane 24 and/or slide his/her thumb or one or more fingers further along the membrane 24 on the second and subsequent uses of the toothbrush 10, compared to the first use, in order to ensure the desired quantity of dentifrice in urged though the conduit 26 and into the space between the bristles 20.

Although not shown in the drawings, a closure, in the form of, for example, a cap, may be provided to cover the head portion 14 and the bristles 20 thus sealing the head portion 14 and the bristles 20 from the atmosphere, thereby reducing or eliminating the aforementioned hygiene problems. Two or more membranes 24 may be provided at opposite surfaces of the body 12, thereby allowing the user to deform both membranes 24 together with, for example, the finger and thumb. Also, two or more orifices 28 together with respective valve membranes 30 may be provided on the surface of the head portion 14 to enhance distribution of the dentifrice between the bristles 20.

In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A disposable toothbrush having a body, the body including a dentifrice reservoir, a head portion, a plurality of bristles connected to the head portion, and a conduit connecting the reservoir to the head portion, wherein the reservoir includes at least one membrane operable on from an external surface of the body to urge dentifrice from the reservoir, through the conduit, towards the head.

2. A disposable toothbrush according to claim 1 wherein the membrane forms part of an external surface of the body.

3. A disposable toothbrush according to claim 1 or 2 wherein the membrane is operable on to deform the reservoir

4. A disposable toothbrush according to any preceding claim wherein at least part of the membrane forms a protruding part of the body

5. A disposable toothbrush according to any preceding claim wherein the conduit terminates at at least one orifice on a surface of the head portion adjacent or close to the position where the bristles are connected to the head portion

6. A disposable toothbrush according to any preceding claim the orifice includes a valve adapted to control flow of the dentifrice through the orifice.

7. A disposable toothbrush according to claim 6 wherein the valve includes a valve membrane having at least one slit therein.

8. A disposable toothbrush according to claim 7 wherein the valve membrane has two slits therein in the form of a cross.

9. A disposable toothbrush according to claim 7 wherein the valve membrane has three slits therein in the forming a 'Y-shape'.

10. A disposable toothbrush according to any one of claims 6 to 9 wherein the valve is a non-return valve

11. A disposable toothbrush according to any preceding claim wherein the toothbrush includes a closure to cover the head portion and bristles.

12. A disposable toothbrush according to any preceding claim wherein the body includes a plurality of gripping formations adapted to facilitate gripping of the toothbrush by the user

13. A disposable toothbrush substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

14. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.

Application No:	GB 0225580.0	**Examiner:**	Denis V. Keseris
Claims searched:	1-13	**Date of search:**	16 January 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	1-8	DE 10035214 A	SCHMIDT - see abstract and figures
X	1-6, 10, 12	US 5599126 A	HOUGH - see abstract and figures
X	1-6, 11	FR 2651102 A	FIZAINE - see abstract and figures
X	1-6, 11	US 5865195 A	CARTER - see abstract and figures
X	1-6, 12	DE 10052512 A	CEBECI - see abstract and figures
X	1-6	FR 2457087 A	LAMBERTIN - see abstract and figures
X	1-6	WO 02/058508 A3	CALLIGARO - see abstract and figures

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[W]:

A4K

Worldwide search of patent documents classified in the following areas of the IPC[7]:

A46B

The following online and other databases have been used in the preparation of this search report:

EPODOC, WPI, and JAPIO